Surface-Mount Glass Passivated Rectifier

SMC (DO-214AB)

Cathode  Anode

LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
V_{RRM}	1200 V
I_{FSM}	300 A
I_R	10 μA
V_F at I_F = 12 A (T_J = 125 °C)	0.90 V
T_J max.	150 °C
Package	SMC (DO-214AB)
Circuit configurations	Single

FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters, and freewheeling diodes for consumer, automotive, and telecommunication.

MECHANICAL DATA

Case: SMC (DO-214AB)

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**S12CQ**	**UNIT**
Device marking code		12Q	
Maximum repetitive peak reverse voltage	V_{RRM}	1200	V
Maximum RMS voltage	V_{RMS}	840	V
Maximum DC blocking voltage	V_{DC}	1200	V
Maximum average forward rectified current	$I_{F(AV)}$ (1)	12	A
	$I_{F(AV)}$ (2)	2	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	300	A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +150	°C

Notes

(1) Mounted on aluminum PCB 10 mm x 10 mm with aluminum heatsink

(2) Free air, mounted on recommended copper pad area

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 6.0 A	T_J = 25 °C	V_F (1)	0.92	-	V
	I_F = 12.0 A			1.0	1.1	
	I_F = 6.0 A	T_J = 125 °C		0.81	-	
	I_F = 12.0 A			0.90	-	
Reverse current	Rated V_R	T_J = 25 °C	I_R (2)	-	10	µA
		T_J = 125 °C		104	350	
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	5	-	µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	79	-	pF

Notes

(1) Pulse test: 300 µs pulse width; 1 % duty cycle

(2) Pulse test: pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**S12CQ**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	87	°C/W
	$R_{\theta JM}$ (3)	4	

Notes

(1) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

(2) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz.

(3) Thermal resistance junction-to-mount to follow JEDEC® 51-14 transient dual interface test method (TDIM)

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
S12CQ-M3/I	0.257	I	3500	13" diameter plastic tape and reel
S12CQHM3/I (1)	0.257	I	3500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

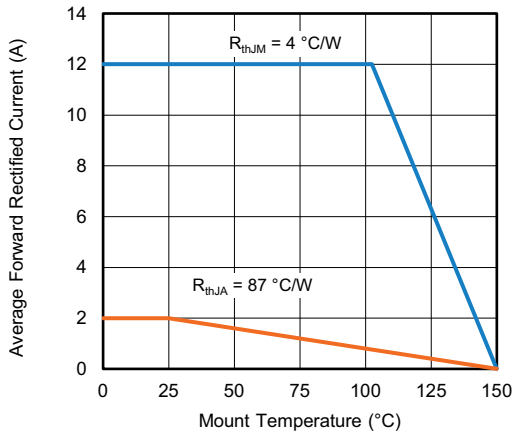


Fig. 1 - Forward Current Derating Curve

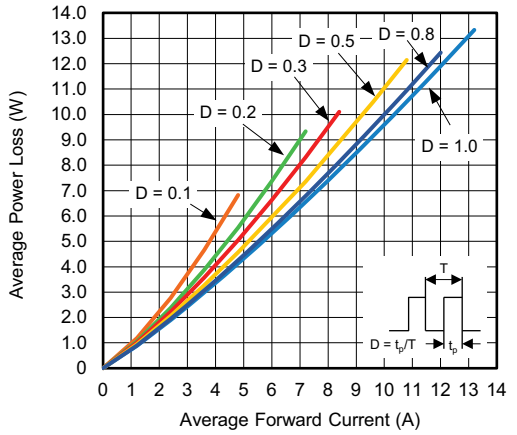


Fig. 2 - Average Power Loss Characteristics

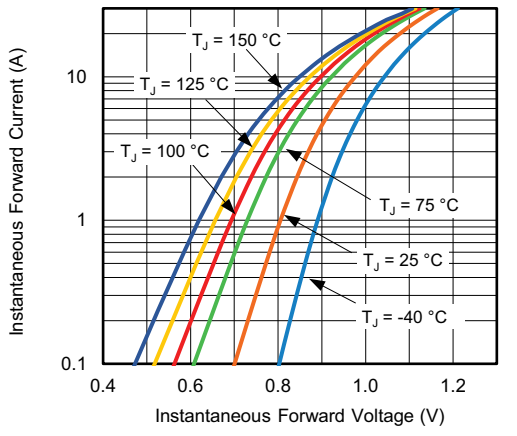


Fig. 3 - Typical Instantaneous Forward Characteristics

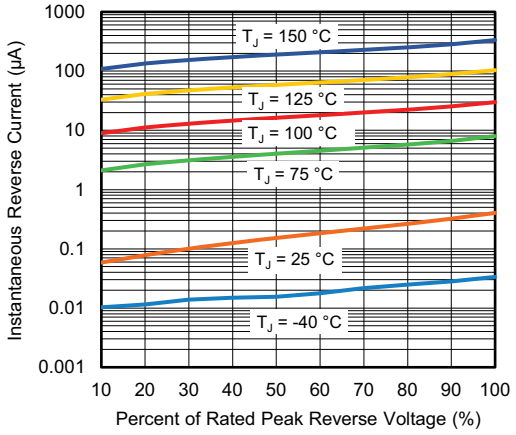


Fig. 4 - Typical Reverse Characteristics

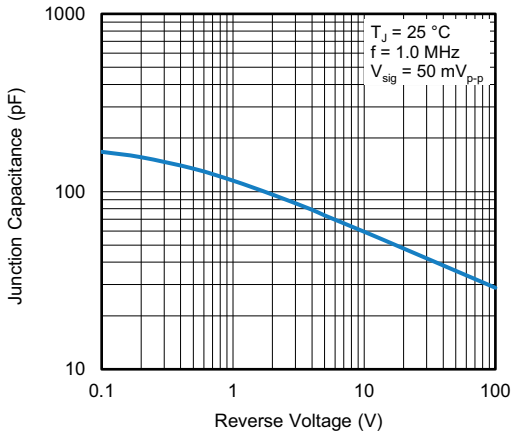


Fig. 5 - Typical Junction Capacitance

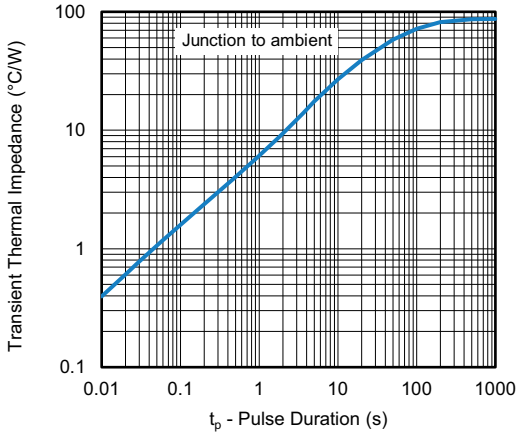
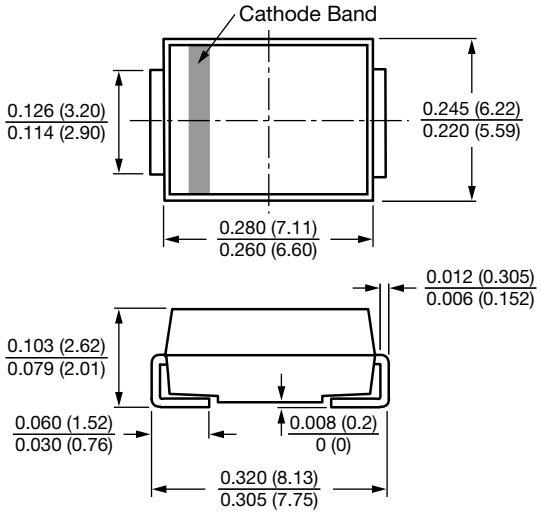


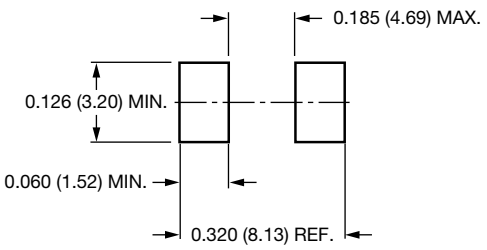
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMC (DO-214AB)



Mounting Pad Layout



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